United States Department of Agriculture
NRCS Natural Resources Conservation Service
Plant Guide

REED CANARYGRASS

Phalaris arundinacea L.

plant symbol = PHAR3

Contributed by: USDA, NRCS, Pullman Plant Material Center, Pullman, Washington

Alternate Names

gardener's-garters (Source: Hortus 3), reed Canary grass (Source: World Econ Pl), ribbon grass (Source: Dict Gard), variegated grass (Source: Webster's Dict), alpiste roseau (Source: Dict Rehm) [French], Rohrglanzgras (Source: Dict Rehm) [German], kusa-yoshi (Source: F Japan Ohwi) [Japanese], caniço-malhado (Source: Dict Rehm) [Portuguese], hierba cinta (Source: Dict Rehm) [Spanish], pasto cinto (Source: Dict Rehm) [Spanish] (USDA, ARS 2002)

Key Web Sites

Extensive information about this species is linked to the Plants web site. To access this information, go to the Plants web site, select this plant, and utilize the links at the bottom of the Plants Profile for this species.

Uses

Use of reed canarygrass in the Pacific Northwest basically began at the turn of the century. Farming commonly followed logging operations and reed canarygrass was frequently used as the "breaking in" crop (Wheeler 1950). Stumps & logging debris and clearing operations left the land unsuitable for planting crops such as small grains. Reed canarygrass was planted in these areas to allow time for the stumps and debris to degrade and be more easily removed at a later date.

Reed canarygrass popularity in the Pacific Northwest was a composite of many factors. It is an extremely productive grass. Reports of production far exceeding other grasses are common in the early literature. It is very easy to establish and it persists very well. Most plantings occurred during a period of history when farms were more self-reliant. Livestock were pastured on the farm, and hay was grown on the farm rather than purchased from hay brokers. It was a reliable, productive forage.

A second wave of interest in reed canarygrass occurred when wastewater management became an important issue. Reed canarygrass has the ability to respond exceedingly well to applied nutrients and one study showed a yield response to levels as high as 920 pounds N/acre (Schmitt et al. 1999). Zeiders (1976) reported, "reed canarygrass is the most popular species for irrigation with wastewater from municipal and industrial sources as a pollution control measure".

The most recent wave of interest in reed canarygrass is occurring in Europe. Reed canarygrass is being cultivated in northern Europe as a biofuel and about 10,000 acres are in production in Scandinavia (Kätterer et al (1998).

It is a plant with many uses. Unfortunately, reed canarygrass has proven to be too aggressive in the Pacific Northwest. It moves out of pastureland and into stream bottoms, wetlands, and canal banks. It persists in areas where it is not desirable and is the bane of wetland restoration.

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g. threatened or endangered species, state noxious status, and wetland indicator values).

Weediness

This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Cooperative Extension Service office, or state natural resource or agriculture department regarding its status and use. Weed information is also available from the PLANTS Web site at plants.usda.gov.

Description

Reed canarygrass is 2-9 feet tall non-native with flat, rough-textured, tapering leaves from 31/2-10 inches

long. The stem is hairless and stands erect. One of the first grasses to sprout in the spring, reed canary grass produces a compact panicle 3-16 inches long that is erect or slightly spreading. The flowers are green to purple early in the season and change to beige over time. The grass forms a thick rhizome system that quickly dominates the soil. There is some debate as to the origin of the species. Sources document native and non-native genotypes of reed canary grass. The non-native strain is thought to be more invasive than native strain.

Distribution: For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Adaptation
Growth of reed canarygrass begins early in the spring, senescence occurs with summer drought, and limited vegetative growth resumes in the fall if moisture is available. Sprouts will frequently be seen growing in ephemeral ponded water in the spring. Carbohydrate reserves stored in the rhizomes fuel the growth of these sprouts (Hovin et al. 1973). The roots are not contributing to the growth in this situation because the ponding causes an anaerobic condition. If the water remains on the stand for a prolonged period the roots will eventually die because the reducing environment will not only deprive roots of oxygen but will also remove oxygen from the roots.

The culms are very tall and individual leaves grow from nodes along the culm. The leaves of the lower culm become light deprived as the plant grows and are replaced with new leaves higher up the culm. If the stand is cut, new leaves will sprout from either rhizomes or from exposed nodes on the shortened culm.

Biomass production is exceedingly high (as high as 9 tons/acre) but it requires a tremendous amount of nutrients to sustain this growth. Riparian soils tend to be very rich in nutrients, allowing reed canarygrass to thrive. Limiting its growth by removing nutrients has not been practical on a field scale. Indeed, there are stands that are hayed every year and a large amount of nutrients subsequently removed, and yet these stands continue to proliferate for decades.

Reed canarygrass is very competitive once established and will frequently develop a solid monoculture. Tall growth enables reed canarygrass to compete with other herbaceous species by depriving them of light. Native herbaceous species that initiate growth late in the spring are especially impacted by reed canarygrass.

Establishment
Rhizomes account for much of the localized spread of reed canarygrass. Rhizomes grow outwardly from a mother plant until the terminal bud develops a shoot (Evans and Ely 1941). This is unlike quackgrass, which develops shoots all along the rhizome axis. This allows reed canarygrass to rapidly expand its local territory and a single rhizome or stem can infest an entire drainage.

Reed canarygrass culms are also capable of rooting and establishing stands (Hovin et al. 1973). Hovin and his coworkers reported that the nodes of reed canarygrass culms become meristematically active once the panicles are removed, and stage of development of the panicle affected the percent survival of the new plants. Pre-anthesis culms rooted poorly while culms from post-anthesis plants rooted better. Bank erosion and transport of culms allows for yet another means of establishing plants along a watercourse.

Management
Seeds require several days at cool temperatures for a high percentage of the seeds to germinate. The rate and amount of germination is typical for most cool season pasture grasses, but pales in comparison to many annual weeds. For comparison, yellow starthistle and cheatgrass can achieve 75% germination within 2 days. Seedling development of reed canarygrass is similar to other cool season pasture grasses. The seedlings lack vigor and are very sensitive to competition. Morrison and Molofsky (1998, 1999) reported that reed canarygrass seedlings were more sensitive to interspecific competition then they were to decreased water availability.

Pests and Potential Problems
Reed canarygrass is a classic weed in many environments but in environments subject to frequent & severe disturbances it has some value. It persists very well in spite of grazing. The grazing period lasts nine months west of the Cascades (Wheeler 1950). Few if any grasses can tolerate grazing pressure this long. It also withstands grazing periods as frequent as 2 weeks between rests with little detrimental effects. It withstands annual burning and spring flooding very well. It also tolerates heavy applications of wastes. It is ecologically “stable state.” The up-side -- it is not very prone to give way to noxious weeds. The down-side -- natural

transition to a higher seral "more native" state is unlikely.

Environmental Concerns
It is a plant with many uses. Unfortunately, reed canarygrass has proven to be too aggressive in the Pacific Northwest. It moves out of pastureland and into stream bottoms, wetlands, and canal banks. It persists in areas where it is not desirable and is the bane of wetland restorationists.

Seeds and Plant Production

Reed canarygrass seed is quite small, very dense, and resembles timothy seed because both are small, heavy, and naked. Fully sodded stands produce only 30-50 pounds seed/acre (Schoth 1938). Old stands tend to have a higher proportion of vegetative culms than reproductive culms. Seed heads are borne on long culms and seeds mature from the top of the head down. Fully ripe seeds are highly viable and shatter readily. Indeterminate maturation allows for a prolonged period of seed dispersal, which reduces seed predation. It also increases the chances of some seed being dispersed by an episodic event such as an animal brushing against a plant and some seed catching in its coat.

Rhizomes account for much of the localized spread of reed canarygrass. Rhizomes grow outwardly from a mother plant until the terminal bud develops a shoot (Evans and Ely 1941). This is unlike quackgrass, which develops shoots all along the rhizome axis. This allows reed canarygrass to rapidly expand its local territory and a single rhizome or stem can infest an entire drainage.

Cultivars, Improved, and Selected Materials (and area of origin)
These plant materials are readily available from commercial sources.

Control
Please contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA, NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

References

Always, F. 1931. *Early trials and use of reed canarygrass as a forage plant*. J. Am. Soc. Agron. 23:64-66.

Evans, M.W. & J.E Ely 1941. *Growth habits of reed canarygrass*. J. Am. Soc. Agron. 33:1017-1027.

Forman, D. 1998. *The effects of shade and defoliation on reed canarygrass (Phalaris arundinacea L.) biomass production: a greenhouse study*. Washington State University, M.S. Thesis, Pullman, Washington.

Hovin, A.W., B.E. Beck, & G.C. Marten 1973. *Propagation of reed canarygrass (Phalaris arundinacea L.) from culm segments*." Crop Sci. 13:747-749.

Kätterer, T., O. Andrén, & R. Pettersson 1998. *Growth and nitrogen dynamics of reed canarygrass (Phalaris arundinacea L.) subjected to daily fertilization and irrigation in the field*. Field Crops Res. 55:153-164.

Kilbride, K.M. & Paveglio 1999. *Integrated pest management to control reed canarygrass in seasonal wetlands of southwestern Washington*. Wildl. Soc. Bull. 27:292-297.

Morrison, S.L. & J. Molofsky 1998. *Effects of genotypes, soil moisture, and competition on the growth of an invasive grass, Phalaris arundinacea (reed canarygrass)*. Can. J. Bot. 76:1939-1946.

Morrison, S.L. & J. Molofsky 1999. *Environmental and genetic effects on the early survival and growth of the invasive grass Phalaris arundinacea*. Can. J. Bot. 77:1447-1453.

Schmitt, M.A., M.P. Russelle, G.W. Randall, C.C. Sheaffer, L.J. Greub, & P.D. Clayton 1999. *Effect of rate, timing and placement of liquid dairy manure on reed canarygrass yield*. J. Prod. Agric. 12:239-242.

Schoth, H.A. 1938. *Reed canarygrass*. USDA Farmers' Bulletin 1602. 11pp.

Sheaffer, C.C., D.W. Miller, & G.C. Marten 1990. *Grass dominance and moisture yield and quality in perennial grass-alfalfa mixtures*. J. Prod. Agric. 3:480-485.

Stannard, M. & W. Crowder 2001. *Biology, history, and suppression of reed canarygrass (Phalaris arundinacea*. USDA, NRCS, Plant Materials

Technical Note 43, Pullman Plant Materials Center, Pullman, Washington. 8pp.

Stout, D. Curator, USDA ARS West Region Plant Introduction Station, Pullman, Washington.

Tsvelev, N. N. 1983. *Grasses of the Soviet Union, Part 1*. Publ.; Oxonian Press Pvt. Ltd., New Delhi

USDA, ARS 2002. *Phalaris arundinacea*. Germplasm Resources Information Network. Beltsville, Maryland

USDA, CSREES 2000. *Pacific Northwest weed control handbook*. Cooperative Extension Services of Idaho, Oregon, and Washington.

Wheeler, W.A. 1950. *Forage and Pasture Crops: a handbook of information about the grasses and legumes grown for forage in the United States.* Publ.; D, Van Nostrand Co., NY

Zeiders, K.E. 1976. *A new disease of reed canarygrass caused by Helminasporium catenarium*. Plant Disease Reporter 60:556-568.

Photo Credits:
"Purdue Forage Information"
http://www.agry.purdue.edu/ext/forages/publications/grasses/reed-canry.htm

"The Nature Conservancy"
http://tncweeds.ucdavis.edu/photos/phaar04.jpg

The use of product names in this document is for simplicity and information, and does not imply endorsement by the NRCS over other equivalent materials.

Prepared By & Species Coordinators:
Mark Stannard and Wayne Crowder, USDA, NRCS, Pullman Plant Material Center, Pullman, Washington

Edited: 11april02 jsp

For more information about this and other plants, please contact your local NRCS field office or Conservation District, and visit the PLANTS Web site<http://plants.usda.gov> or the Plant Materials Program Web site <http://Plant-Materials.nrcs.usda.gov>